

N.E. 9. A display device according to Claim 7, wherein said charged film comprises a ferroelectric material or an electret material.

10. A display device according to Claim 7, wherein said insulating liquid has a volumetric resistivity of at least 10^{12} ohm.cm.

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cancel. 11. (Amended) A display device according to Claim 7, wherein said two electrodes are oppositely disposed in the cell structure so as to allow vertical movement of said colored charged particles between said electrodes.

12. (Amended) A display device according to Claim 7, wherein said two electrodes are disposed on an identical plane in the cell structure so as to allow horizontal movement parallel to the plane of said colored charged particles.

REMARKS

In view of the above amendments and the following remarks, Applicants request favorable reconsideration and allowance of the above-identified application.

Claims 1 and 3-12 are now pending in this application, with Claims 1 and 7 being the independent claims. By this Amendment, Applicant has amended the specification and Claims 1, 5-9, 11 and 12, and canceled Claim 2. No new matter has been added.

Claims 1, 3, 5, 7-9 and 11 stand rejected under 35 U.S.C. § 102 over U.S. Patent No. 3,792,308 (Ota). Claims 6 and 12 stand rejected under 35 U.S.C. § 103 over the Ota patent in further view of U.S. Patent No. 6,172,798 (Albert, et al.). Claim 2 stands rejected under 35 U.S.C. § 103 over the Ota patent in further view of U.S. Patent No. 5,587,264 (Iijima, et al.). Applicants traverse these rejections.

Initially, Applicants note that the Albert, et al. patent has a U.S. filing date of May 15, 2000, while the present application has a U.S. filing date of January 7, 2000. Accordingly, that patent is not proper prior art with respect to the present application.

Applicants' invention is generally directed to an electrophoretic display device of a cell structure. The device includes at least two electrodes, fixing surfaces each associated with one of the at least two electrodes, and an electrophoretic layer disposed in the cell. The electrophoretic layer includes an insulating liquid and colored charged particles disposed in the layer. In addition, the device includes voltage application means for applying a voltage between the electrodes to cause migration of the colored charged particles toward and collective attachment onto one of the fixing surfaces.

As recited in independent Claim 1, the device also includes an adhesive layer provided with at least one of the fixing surfaces and the colored charged particles, thus allowing repetitive attachment thereto and separation therefrom of the colored charged particles. The adhesive layer comprises a copolymer comprising polymerized units of comonomers selected from the group consisting of (meth)acrylate esters, (meth)acrylate acid, (meth)acrylonitrile, vinyl esters and vinyl ethers.

As recited in independent Claim 7, the fixing surfaces are provided with a charged film having a constant surface charge of a polarity opposite to that of the colored charged particles.

The Ota patent is directed to an electrophoretic display device of the luminescent type. That device includes an insulating layer 43 of vinyl acetate resin, polystyrol or gelatin, disposed on an electrode 8. That insulating layer is provided in order to obtain a high resistance between electrodes and prevent an insulation breakdown of the suspension layer. Applicants submit that the Ota patent is silent as to the provision of an adhesive layer for improving the memory characteristic of the display device. Specifically, Applicants submit that that document does not describe or suggest use of the claimed class of copolymers, which generally benefit controlled Tg, adhesiveness and peelability of colored charged particles.

The Iijima, et al. patent is directed to an electrostatic information recording medium. That document describes a low-Tg resin layer 211a that changes its electroconductivity on heating or cooling to stabilize the recorded electrostatic information. Therefore, Applicants submit that this document does not describe the claimed improvement to a resin layer contacting an insulating liquid in an electrophoretic display device. In addition, the Iijima, et al. patent does not describe or suggest the provision of an adhesive layer composed of the claimed class of copolymers.

Accordingly, Applicants submit that the Ota and Iijima, et al. patents, taken alone or in combination, fail to disclose or suggest at least the features of an adhesive layer provided with at least one of the fixing surfaces and colored charged particles, the adhesive



layer allowing repetitive attachment thereto and separation therefrom of the colored charged particles, wherein the adhesive layer comprises a copolymer comprising polymerized units of comonomers selected from the group consisting of (meth)acrylate esters, (meth)acrylate acid, (meth)acrylonitrile, vinyl esters and vinyl ethers, as recited in independent Claim 1.


With respect to independent Claim 7, Applicants note that the Office Action does not indicate where either of the Ota or Iijima, et al. patents describes a charged film having a constant surface charge of a polarity opposite to that of the colored charged particles. Applicants submit that those documents fail to describe or suggest at least a charged film having such a constant surface charge, as recited in independent Claim 7.

For the foregoing reasons, Applicants submit that independent claims are allowable over the documents of record, and request withdrawal of the rejections under 35 U.S.C. §§ 102 and 103.

The remaining claims in the present application are dependent claims which depend from the independent claims discussed above, and thus are patentable over the applied documents for the reasons noted above with respect to those independent claims. In addition, each recites features of the invention still further distinguishing it from the applied patents. Applicants request favorable and independent consideration thereof.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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**VERSIONS WITH MARKINGS TO SHOW
CHANGES MADE TO SPECIFICATION**

Please amend the paragraph starting at page 15, line 26, and ending at page 16, line 12, as follows.

--Adhesiveness or tackiness between two substances may be evaluated based on solubility parameters (SP values) of the two substances. Two [substrates] substances having closer SP values may exhibit a better mutual solubility, and in case where one is solid, exhibit a better wettability (e.g., as disclosed in "Adhesive Handbook" published from Nikkan Kogyo Shimbum K.K.). Polymers may exhibit [an] SP values over a broad range of from 6 of polytetra-fluoroethylene to 16 of polyacrylonitrile. Accordingly, in the present invention, it is preferred to select an adhesive layer material in view of the SP value of the materials constituting the fixing surface of the colored charged particles.--

**VERSIONS WITH MARKINGS TO SHOW
CHANGES MADE TO THE CLAIMS**

1. (Amended) An electrophoretic display device of a cell structure,
comprising:

at least two electrodes[.];

fixing surfaces each associated with one of said at least two electrodes[.];

an electrophoretic layer disposed in the cell and comprising an insulating
liquid and colored charged particles disposed in [the] said electrophoretic layer[, and];

voltage application means for applying a voltage between [the] said
electrodes thereby causing migration of [the] said colored charged particles toward and
collective attachment onto one of [the] said fixing surfaces; [wherein] and
an adhesive layer provided with at least one of [the] said fixing surfaces and
[the] said colored charged particles, [is provided with an adhesive layer] said adhesive
layer allowing repetitive attachment thereto and separation therefrom of [the] said colored
charged particles

wherein said adhesive layer comprises a copolymer having a glass transition
temperature (Tg) of -35°C to +35°C and comprising polymerized units of comonomers
selected from the group consisting of (meth)acrylate esters, (meth)acrylate acid,
(meth)acrylonitrile, vinyl esters and vinyl ethers.

5. (Amended) A display device according to Claim 1, wherein said two electrodes are oppositely disposed in the cell structure so as to allow vertical movement of [the] said colored charged particles between [the] said electrodes.

6. (Amended) A display device according to Claim 1, wherein said two electrodes are disposed on an identical plane in the cell structure so as to allow horizontal movement parallel to the plane of [the] said colored charged particles.

7. (Amended) An electrophoretic display device of a cell structure, comprising:

at least two electrodes[.];

fixing surfaces each associated with one of said at least two electrodes[.];

an electrophoretic layer disposed in the cell and comprising an insulating liquid and colored charged particles disposed in [the] said electrophoretic layer[.]; and

voltage application means for applying a voltage between [the] said electrodes thereby causing migration of [the] said colored charged particles toward and collective attachment onto one of [the] said fixing surfaces[.];

wherein [the] said fixing surfaces are provided with a charged film having a constant surface charge of a polarity opposite to that of [the] said colored charged particles.

8. (Amended) A display device according to Claim 7, wherein said charged film is formed on [the] said fixing surfaces given by [the] said electrodes.

11. (Amended) A display device according to Claim 7, wherein said two electrodes are oppositely disposed in the cell structure so as to allow vertical movement of [the] said colored charged particles between [the] said electrodes.

12. (Amended) A display device according to Claim 7, wherein said two electrodes are disposed on an identical plane in the cell structure so as to allow horizontal movement parallel to the plane of [the] said colored charged particles.